

REMARKS

By the present amendment, claims 13, 17, 18, 19, 24, 29 and 41-43 have been amended to obviate the examiner's objections thereto and/or to further clarify the concepts of the present invention. Claims 1-11, 13-38 and 41-43 are now in the application. Claims 1-11 have been withdrawn. Entry of these amendments is respectfully requested.

Claims 13, 17, 18, 19, 24, 29 and 42-43 were rejected under the second paragraph of 35 USC §112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In so doing, it apparently was asserted that there were no structural limitations recited in independent claims 13, 17, 18, 19 and 24 to link the second and third valves with the other claimed elements. It was suggested that a second and third pipe or gas discharge line and liquid chemical discharge line connected to the preparation tank be positively recited and specify that the second and third valves are located therein. Regarding claims 42 and 43, it was asserted that these claims were directed to process limitations, and it was suggested that these claims be amended to recite that the controller is programmed to perform the claimed functions. Reconsideration of this rejection in view of the above claim amendments and the following comments is respectfully requested.

As was noted above, the claims have been amended as suggested to overcome the objections as set forth in the rejection. Accordingly, withdrawal of the rejection under the second paragraph of 35 U.S.C. § 112 is respectfully requested.

Certain of the pending claims were rejected over the cited art in a series of rejections. These rejections were:

Claims 13-15 and 23 were rejected under 35 USC §102(b) as being anticipated by the patent to Nakajima et al.

Claims 13-16, 23, 29, 34, 38 and 41-43 were rejected under 35 USC §102(b) as being anticipated by the patent to Ginsburgh et al.

Claims 13-16, 20-23, 29, 34-35, 37-38 and 41-43 were rejected under 35 USC §103(a) as being unpatentable over the patent to Nurmi.

Claims 20-22, 30-31 and 36 are rejected under 35 USC §103(a) as being unpatentable over the patent to Nakajima et al., as applied to claims 13-15, 23, 29, 34, 37 and 38 above, and further in view of the '080 Japanese patent publication to Sakamoto Naoki.

Reconsideration of all of these rejections in view of the above claim amendments and the following comments is requested.

Before discussing the rejection in detail, a brief review of the presently claimed invention may be quite instructive. The claimed invention is directed generally to a chemical solution preparation apparatus (1) including a chemical solution refinement device (11), which dissolves a chemical gas into a liquid and prepares a refined chemical solution. As shown in Fig. 2, the chemical solution refinement device (11) includes:

- a preparation tank (21) for storing a liquid;
- a first pipe (L4) for supplying the chemical gas into the preparation tank;
- a first valve (35) arranged in the first pipe for opening and closing the first pipe;
- a gas discharge pipe (L5) for discharging the chemical gas that was not dissolved in the liquid during the gas dissolving from the preparation tank;
- second valve (44) arranged in the gas discharge pipe for opening and closing the gas discharge pipe;
- a liquid discharge pipe (L7) for discharging a predetermined amount of the chemical solution from the preparation tank;
- a third valve (46) arranged in the liquid discharge pipe for opening and closing the liquid discharge pipe; and
- a controller (31) programmed to operate the first, second and third valves.

When the controller operates the first valve to supply the chemical gas to the preparation tank, the controller operates the second valve and the third valve to continuously and

simultaneously discharge an adjusted amount of the undissolved chemical gas and a predetermined amount of the chemical solution that is under preparation from the preparation tank. By continuously discharging a predetermined amount of the chemical solution and undissolved chemical gas from the preparation tank during dissolving, impurities can be efficiently eliminated from the preparation tank and a chemical solution essentially free of impurities can be prepared.

It is submitted that none of the cited patents teach or suggest, among other things, an important technical feature of the presently claimed invention that the controller operates to continuously and simultaneously discharge undissolved chemical gas and a predetermined amount of liquid chemical solution from the preparation tank by controlling the first, second, and third valves so as to prepare an essentially impurity-free chemical solution. It is therefore submitted that the claims directed to the above as amended herein patentably distinguish over the cited patent publications whether taken singly or in combination.

More particularly, the Nakajima et al patent discloses circulating a liquid chemical during preparing the liquid chemical. The Ginsburgh patent discloses saturating a liquid fuel with carbon dioxide gas to prepare a safety-enhanced combustion fuel. The Nurmi patent discloses a manual valve V6 for discharging liquid from a vessel 106. As described on col. 6, lines 36-45, the manual valve V6 is opened when the vessel 106 is to be

served. However, the Nakajima et al patent, the Ginsburgh et al patent, nor the Nurmi et al patent does not teach or suggest, among other things, an apparatus having a controller programmed to operate to continuously and simultaneously discharge undissolved chemical gas and a predetermined amount of liquid chemical solution from the preparation tank.

It is further submitted that the Sakamoto Naoki Japanese patent publication does not supply the teaching deficiencies of the Nakajima et al patent. The Japanese patent publication merely discloses bubbling gas in a liquid. However, the publication does not teach or suggest operating to continuously and simultaneously discharge undissolved chemical gas and a predetermined amount of liquid chemical solution from the preparation tank during a gas-bubbling operation so as to eliminate impurities from the liquid.

In summary, it is submitted that the subject claims distinguish over the above cited patents in that, among other things, the recited preparation apparatus includes a controller (31) programmed to operate the first (35), second (44) and third (46) valves. When the controller operates the first valve to supply the chemical gas to the preparation tank, the controller operates the second valve and the third valve to continuously and simultaneously

discharge an adjusted amount of the undissolved chemical gas and a predetermined amount of the chemical solution that is under preparation from the preparation tank. By continuously discharging a predetermined amount of the chemical solution and undissolved chemical gas from the preparation tank during dissolving, impurities can be efficiently eliminated from the preparation tank and chemical solution essentially free of impurities can be prepared.

For the reasons stated above, withdrawal of the rejections under 35 U.S.C. § 102(b) and § 103(a) and allowance of claims 13-16, 20-23, 29-31, 34-38 and 41-43 over the cited patent publications are respectfully requested.

Although not specifically indicated, it is noted that claims 17-19, 24-28, 32 and 33 were not rejected over the cited art.

In view of the foregoing detailed discussion and the amendments herein, it is submitted that the subject application is now in condition for allowance and early notice to that effect is earnestly solicited.

In the event this paper is not timely filed, the undersigned hereby petitions for an appropriate extension of time. The fee for this extension may be charged to Deposit Account No. 01-2340, along with any other additional fees which may be required with

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respect to this paper.

Respectfully submitted,

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